Volunteer Lake Assessment Program Individual Lake Reports

LOON POND, GILMANTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,088	**Max. Depth (m):**	13.6	**Flushing Rate (yr^{-1}):**	0.6
Surface Area (Ac.):	121	**Mean Depth (m):**	7	**P Retention Coef:**	0.69
Shore Length (m):	3,100	**Volume (m^3):**	3,436,000	**Elevation (ft):**	904

TROPHIC CLASSIFICATION

Year	Trophic class
1980	MESOTROPHIC
1996	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

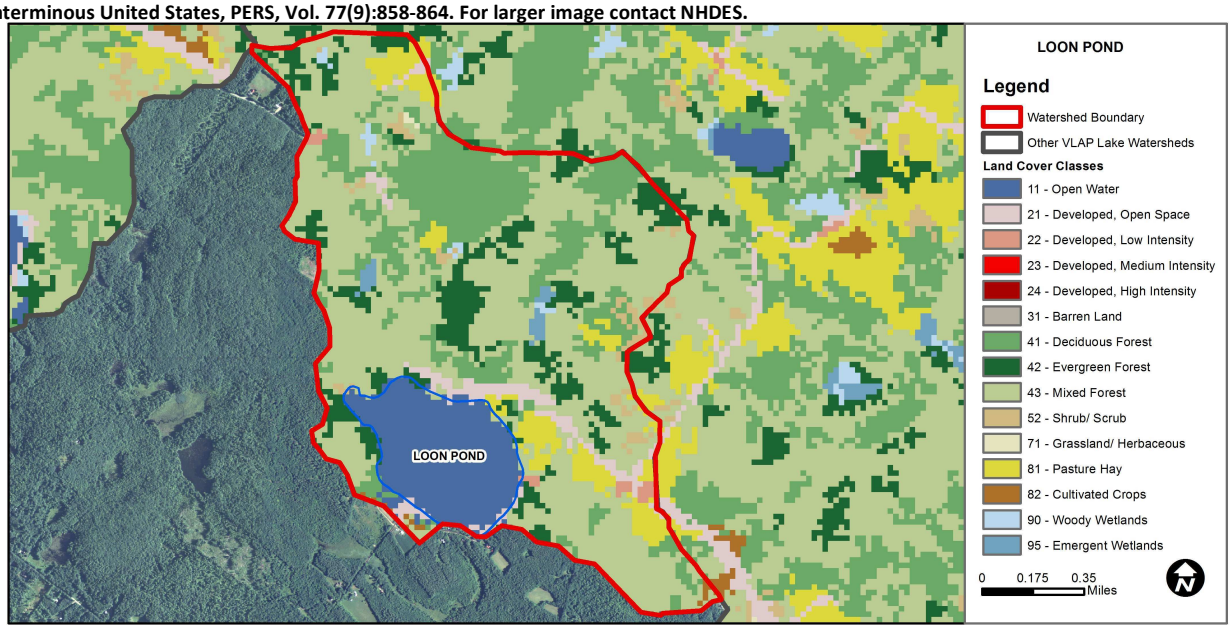
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Very Good	The calculated median is from 5 or more samples and is <= 1/2 indicator.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

LOON LAKE - LOON LAKE BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	11.2	Barren Land	0	Grassland/Herbaceous	0.08
Developed-Open Space	3.24	Deciduous Forest	18.53	Pasture Hay	5.41
Developed-Low Intensity	0.6	Evergreen Forest	10.82	Cultivated Crops	0.31
Developed-Medium Intensity	0	Mixed Forest	47	Woody Wetlands	0.5
Developed-High Intensity	0	Shrub-Scrub	1.65	Emergent Wetlands	0.74

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2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were very low in July and increased slightly in August, but average chlorophyll levels remained less than the state median. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot, Gardner Cove Inlet and Outlet conductivity and chloride levels continue to be slightly elevated and greater than the state medians. Historical trend analysis indicates highly variable epilimnetic (upper water layer) conductivity levels since monitoring began. Bertrand and Varney Bk. conductivity and chloride levels were approximately equal to the state medians and we hope to see this continue.
- **Total Phosphorus:** Deep spot total phosphorus levels were low in July and increased to average levels in August, although hypolimnetic (lower water layer) phosphorus levels were slightly elevated. Historical trend analysis indicates significantly increasing (worsening) epilimnetic phosphorus since monitoring began. Bertrand Bk. and Gardner Cove Inlet phosphorus levels increased slightly in August following a rain event but were within an average range for those stations. Outlet and Varney Bk. phosphorus levels were low for those stations.
- **Transparency:** Transparency was very good in July and transparency measured with the viewscope (VS) was much better than without and likely a more accurate measurement. Transparency decreased in August potentially due to wind and wave action. Average transparency was much better than the state median and historical trend analysis indicates relatively stable transparency since monitoring began.
- **Turbidity:** Epilimnetic, Metalimnetic (middle water layer), Outlet, and Varney Bk. turbidities were low on each sampling event. Hypolimnetic turbidity was slightly elevated in July and August potentially due to bottom sediment and/or the accumulation of organic compounds when dissolved oxygen levels decrease to below 1.0 mg/L in the hypolimnion. Bertrand Bk. turbidity was elevated in August following a rain event, and Gardner Cove Inlet turbidity was elevated on each sampling event during moderate to high flow conditions. Wetland flushing may contribute to elevated turbidities at Gardner Cove Inlet.
- **pH:** Epilimnetic and Metalimnetic pH levels were within the desirable range of 6.5—8.0 units, however Hypolimnetic pH levels were less than desirable. Historical trend analysis indicates stable epilimnetic pH since monitoring began.
- **Recommended Actions:** Bertrand Bk. conductivity levels have decreased greatly in 2013 and 2014 and this is a positive sign that better winter road maintenance activities are having the desired affect. The increasing epilimnetic phosphorus trend is a concern and potentially a result of the increased frequency and intensity of storm events. Stormwater runoff from these event transports sediments and other pollutants into the lake that can increase phosphorus levels and promote algal growth. Educate lake and watershed residents on ways to reduce stormwater runoff from their properties and utilize DES' "NH Homeowner's Guide to Stormwater Management" to implement stormwater best management practices. Maintain vegetated buffers along the lake and tributary shorelines and utilize phosphate free fertilizers if necessary. Keep up the great work!

Table 1. 2014 Average Water Quality Data for LOON POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	6.65	2.61	19	94.7	8	4.80	7.42	0.61	6.89
Metalimnion				92.6	9			0.88	6.62
Hypolimnion				93.5	18			5.92	6.35
Bertrand Brook			4	44.1	12			1.45	6.92
Gardner Cove Inlet			39	163.7	17			3.52	6.74
Outlet				94.6	7			0.69	6.88
Varney Brook			4	45.7	13			0.93	6.78

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
pH (epilimnion)	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Worsening	Data significantly increasing.